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APPLICABILITY OF COMPOSITE INDICES OF NUTRITIONAL STATUS IN ELDERLY HEMODIALYIS PATIENTS

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The composite indices of nutritional status have been largely applied to assess protein energy wasting (PEW) in hemodialysis (HD) patients, but the applicability in elderly HD patients remains unknown. We aimed to assess whether the prevalence of PEW differs depending on the composite indice applied and, to evaluate the concurrent concordance between the composite indices and objective methods of nutritional status. Sixty-four elderly HD patients (male 72%; 70 ± 3, 4 years old) were included. The indices chosen were those validated for HD and/or with high applicability in clinical practice: 7 points subjective global assessment (7p-SGA), malnutrition inflammation score (MIS), the criteria proposed by the International Society in Renal Nutrition and Metabolism (ISRNM) and the mini-nutrition assessment (MNA). For 7p-SGA and MIS, PEW was defined as score ≤5 and > 6, respectively. The objective parameters used to evaluate the concurrent concordance were BMI, body fat % (B Fat; skinfold thicknesses), phase angle (P Angle; BIA), handgrip strength (HGS; dynamometer) and serum albumin. The prevalence of PEW and the objective methods which values differed significantly between well-nourished (WN) x PEW patients across the 4 composite indices are described below:

	7p-SGA	MIS	IRSNM	MNA
PEW (%)	53%	81%	28%	20%
	WN x PEW	**WN x PEW**	**WN x PEW**	**WN x PEW**
BMI	NS	NS	< 0.05	NS
B fat %	< 0.05 [2]	< 0.05 [1,2]	< 0.05 [1,2]	< 0.05 [2]
P Angle	NS	< 0.05 [1]	< 0.05 [1]	NS
HGS	NS	NS	NS	NS
Albumin	NS	NS	NS	NS

NS: not significant; [1] for male; [2] for female

A large variation in the prevalence of PEW was observed among the composite indices. No composite indice agreed concurrently with all objectives methods. The IRSNM, followed by the MIS had the greater concordance with the objective methods in elderly HD patients.

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VALIDATION OF THE SUBJECTIVE GLOBAL ASSESSMENT AND MALNUTRITION INFLAMMATION SCORE TRANSLATED TO PORTUGUESE FOR ELDERLY PATIENTS ON HEMODIALYSIS.

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We aimed to validate the translation of the 7 point subjective global assessment (7 p-SGA) and malnutrition inflammation score (MIS) from English to Portuguese to be applied for elderly patients on hemodialysis (HD). For the translation, the back-translation method was used. First, two independent bilinguals renal dietitians (Portuguese native speakers) worked independently to translate the 7 p-SGA and MIS to Portuguese. After that, the final version was back translated to English by a bilingual English teacher (Portuguese native speaker). In order to investigate the conceptual and semantic equivalence of the translated version, a renal dietitian (English native speaker) compared each item of the original English version of the 7 p-SGA and MIS to the back translated English version by rating the similarity between both questionnaires from 1 to 100 (being 100 the highest degree of similarity). The degree of similarity was 96.8 ± 7.8 for 7p-SGA and 99.6 ± 1.4 for MIS, indicating that the Portuguese versions had equivalent meaning to the original English version. We then performed the validation of the Portuguese version by assessing the concurrent concordance of both nutritional composite indices with objective methods (BMI, body fat %, phase angle, handgrip strength and albumin) in 64 elderly patients on HD (male 72%; 70 ± 3 years old). The 7p-SGA was rated as well nourished (score 7-6; n= 30); mildly to moderately malnourished (5-3; n= 34) and severely malnourished (2-1; no patient). The MIS was rated as normal nutrition (score: 0–5; n= 12); mild malnutrition (6–10; n= 38), and moderate-to-severe malnutrition (≥11; n= 14). Among the objective methods, only body fat % differed ($P < 0.05$) between well-nourished and malnourished patients for the 7p-SGA, and for MIS, the same was observed only for body fat % and phase angle. In conclusion, these preliminary results suggest that for elderly patients on HD, the scores proposed by the 7p-SGA and MIS for screening patients with protein energy wasting should be reviewed.

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PREVALENCE OF SARCOPENIA IN ELDERLY PATIENTS ON HEMODIALYSIS.

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Sarcopenia is strongly associated to aging and can be defined as a decrease in muscle mass, strength and muscle quality. Hemodialysis (HD) patients are exposed to several factors that lead to a loss of muscle mass, which in turn can accelerate the development of sarcopenia. We aimed to evaluate the prevalence of sarcopenia and to compare the nutritional and inflammatory profile of sarcopenic and non-sarcopenic elderly patients on HD. Seventy-four elderly patients on HD (68.9% male; age: 69.3 ± 6.4 years) were included. Sarcopenia was defined by a handgrip strength (HGS) < 10th percentile of a Brazilian population-based reference study. Obesity was defined as body fat % (sum of skinfold thicknesses) above the median values for men (≥26%) and women (≥39%); abdominal obesity as waist circumference ≥102 cm in men and ≥88 in women and inflammation (ultra sensitive C-reactive protein -CRP) as CRP ≥10 mg/L. Sarcopenia was observed in 41% of the patients. No significant difference was observed between Sarcopenic (n= 30; Male 67%; Age 69 ± 6.2 years; BMI 24.5 ± 4.9 kg/m^2) and non-sarcopenic (n= 44; Male 73%; Age 69.7 ± 6.6 years; BMI: 26.2 ± 4.5 kg/m^2) groups, as shown below:

	Sarcopenic Group (n= 30)	Non-Sarcopenic Group (n= 44)
Diabetes (n; %)	12 (40)	13 (30)
Obesity (n; %)	13 (43)	24 (55)
Abdominal Obesity (n; %)	10 (33)	21 (48)
Inflammation (n; %)	8 (27)	9 (20)

In conclusion, sarcopenia is highly prevalent in elderly HD patients and the inflammatory profile of sarcopenic and non-sarcopenic patients is similar. In addition, these results show that sarcopenia does not exclude the occurrence of increased adiposity, as shown by the elevated frequency of obesity and abdominal obesity in the elderly sarcopenic group.

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NLRP3-MEDIATED RENAL LIPID ACCUMULATION OCCURS DURING EARLY DEVELOPMENT OF DIET-INDUCED CHRONIC KIDNEY DISEASE

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Metabolic syndrome (MetSyn) is an important risk factor for the development of chronic kidney disease (CKD). Metsyn-driven CKD is characterized by a state of chronic low-grade inflammation and the innate immune receptor Nlrp3 mediates inflammation. Therefore, we investigated the role of Nlrp3 on the development of Metsyn-driven CKD.

Nlrp3 -/- (Nlrp3ko) and wild-type C57BL/6J (wt) mice (n=8 per group) were subjected to either a control diet or a Western diet (WD) containing increased fat and cholesterol levels. Diets continued for 16 weeks after which mice were sacrificed. A Western diet induced Metsyn in both wt and Nlrp3ko mice to a similar extent. Although renal function was preserved, the development of CKD was established in wt WD mice as reflected by the presence of micro-albuminuria, inflammation and fibrosis. No development of CKD could be seen in Nlrp3ko mice fed a WD. Development of Metsyn-driven CKD was observed together with an increase in vacuolated proximal tubuli, renal cholesterol and

phospholipid levels in wt WD mice. Phospholipids were visualized using a Nile Red staining and co-localized with vacuolated tubuli. Oil Red O Staining showed increased numbers of granulus containing neutral lipids in proximal tubuli of wildtype Western diet-fed mice. Unexpectedly, no renal lipid accumulation occurred in Nlrp3ko mice fed a Western Diet. A Western diet induced cholesterol accumulation in wildtype mice despite decreased uptake, increased excretion and decreased synthesis based on gene expression analysis.

We propose a novel role for the immune receptor Nlrp3 in mediating renal cholesterol and phospholipid accumulation during the early development of Metsyn-driven CKD. Further research is conducted to investigate the therapeutic potential of Nlrp3 in early renal CKD development.

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HIGH BODY MASS INDEX (BMI) IS ASSOCIATED WITH ADIPOKINES AND INSULIN RESISTANCE IN NONDIALYSED CHRONIC KIDNEY DISEASE (CKD) PATIENTS

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The aim of this study was to assess the association between body adiposity with adipokines and with insulin resistance in non-dialysed CKD patients. This is a cross-sectional study including CKD patients under regular treatment in an outpatient clinic. Glomerular filtration rate was estimated by MDRD equation (eGFR). The nutritional status was assessed by BMI, total body fat (BF; dual-energy X-ray absorptiometry), midarm muscle circumference and serum albumin. Laboratorial parameters included serum glucose, triglycerides; leptin and insulin (radioimmunoassay); high molecular weight adiponectin (HMWAdipo; ELISA). The insulin resistance was assessed by HOMA-IR. Data are expressed as mean $\pm$ SD. One hundred and thirty four CKD patients (male=56%; eGFR= 29 ± 13ml/min.; 65 ± 12 years old) were included. None of the patients presented protein energy wasting and most of them had BMI ≥ 25kg/m^2 (overweight/obese group: OwOb) (n= 72; 54%). BMI was correlated with BF (r= 0.74; $p < 0.0001$). Both BMI groups showed similar eGFR and CKD stages distribution (stage 3:42%, 4: 37%, 5: 21%), hence the comparisons were held between groups with normal and OwOb BMI. The OwOb group had BMI, BF, glucose, triglycerides, leptin and HOMA-IR higher than normal BMI group ($P < 0.05$), while HMWAdipo was lower in OwOb group ($P < 0.05$). BMI was significantly associated with leptin (r= 0.58); HOMA-IR (r= 0.36) and HMWAdipo (r= -0.45). HOMA-IR was associated with leptin (r= 0.28) and with HMWAdipo (r= -0.29) ($P < 0.01$), even after adjusting for BF, eGFR, gender and age.

In conclusion, BMI and BF were associated with increased leptin and HOMA-IR, but with decreased HMWAdipo. The OwOb CKD patients presented higher risk for metabolic and cardiovascular disorders.

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INFLAMMATION IS ASSOCIATED WITH EXCESSIVE BODY ADIPOSITY IN NONDIALYSED CHRONIC KIDNEY DISEASE (CKD) PATIENTS

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The purpose of this study was to evaluate inflammation in non-dialysed CKD patients with normal and high body adiposity level. One hundred and thirty four CKD patients (male: 56%; age=65 ± 12 years) under treatment for 3.0 ± 2.0 years were evaluated in a cross-sectional study. Glomerular filtration rate (eGFR) was estimated by MDRD equation. Body adiposity was assessed by BMI and total body fat (BF; dual-energy X-ray absorptiometry). Laboratorial measurements were: albumin, pro-inflammatory cytokines by Multiplexed analysis: tumor necrosis factor-α, interferon-γ, high sensitive C reactive protein, monocyte chemotactic protein, inteleukine 6 and 8, intercellular adhesion molecule-1 and vascular adhesion molecule-1. The inflammation status was defined according to the median values for each studied pro-inflammatory cytokines: negative for inflammation (Infl-) ($<$ median), positive for inflammation (Infl+) ($\geq$ median). The cytokines were compared between patients with normal BMI (<25kg/m^2) (46%; BMI=22.2 ± 1.9) and high BMI (≥ 25kg/m^2) (BMI=28.8 ± 2.8). Both groups showed similar eGFR and CKD stages distribution (stage 3:42%, 4: 37%, 5: 21%). BF and all cytokines were higher in high BMI group than in normal BMI ($P < 0.0001$). BMI and BF were correlated (r= 0.74; $P < 0.0001$). The Infl+ condition was more prevalent, for all cytokines, in the high BMI group (range:61–76%) than in normal (24–38%). Multivariate logistic regression analysis, for all cytokines, showed that Infl+ condition was associated with high BMI (Odds Ratio range: 2.5–4.2; 95%CI: 1.1 - 9.6; $P < 0.01$), even after adjusted for age, gender, diabetes and eGFR. In conclusion, CKD patients with high BMI and body adiposity are at higher risk for inflammation. Therefore, the excess of adiposity should be carefully treated in these patients.

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SPANISH MULTICENTRIC STUDY ABOUT NUTRITION-INFLAMATIONHN WITH MID DILUTION (ENIMID STUDY): PRELIMINARY RESULTS

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Introduction and aims: The prevalence of malnutrition are 23-76% of ESRD patients undergoing HD, and 20-50% of them suffers inflammation. Nowadays, the "malnutrition-inflammation" duo is frequently found in HD patients.The aim of this Spanish multicenter study is to evaluate the effects of the Mid-Dilution HDF on the inflammatory-nutritional state, on some body composition and on the quality of life in the HD patients. The total number of patients expected 64; the preliminary analysis of 52 patient/3 months and 23 after 6months (the study will last 1 year), is presented.
Methods: Patients undergoing standard HD treatment with High Flux dialyzers for 4 hours/three times a week passed to HDF Online MidDilution with OLPUR 220 filters at a reinfusion rate of 12l/h.The patients are classified by: age, gender, Charlson comorbidity index, dialysis vintage. The parameters analyzed each 3 months are: urea, β2microglobuline, albumin, pre-albumin, CRP, fibrinogen, IL6, IL10, leptin, adiponectin, neuropeptide Y, body composition by BIVA parameters and apetite and quality life surveys.
RESULTS: Patients classification: • Age: 64.06 ± 0.8 years; • Sex: 64% male; • Charlson-index: 3.97 ± 1.66; • HD vintage 54.7 ± 44.8 months.Significant decrease of β2microglobuline pre-dialysis from baseline 26,16 to 20,06 mg/L (p= 0,006) after 3 months and to 17,88smg/L (p= 0.09) after 6 months. xβ2microglobulineRR was 82.45 ± 3.20 % and the URR was 79.56 ± 3.51 %, which demonstrates a good removal of medium and small molecules. The Kt/V remained stable ($>$1,5). Albumin increased from 3.81 g/dL to 3.87 g/dL in e months and to 3.89 g/dL in the 6 months of evaluation. No significant differences in levels of pre-albumin (xbaseline 28 mg/dl). Corporal and BIVA parameters evolution These data shown an improvement of the body composition and water distribution. .Sig. improvements were seen in the appetite scale in the first 6 months (p= 0.09). The total Quality of Life, evaluated in 3 months by SF36, increased from 55,61 to 50,66 (p= 0,05); the physic from 50,28 to 55,92 (p= 0,036); the mental from 55,69 to 60,1 (p= 0,12).Cytokines:we found an increase in neuropeptide Y and IL10 and no significant changes in leptin and adiponectin with slight increase of IL6.
CONCLUSIONS: 1-The preliminary results show that MidDilution provides a good removal of small and middle molecules, increases appetite by providing a proper balance of cytokines through stimulation of antiinflamatory ones and neuropeptide Y. 2-It provides an improvement of body composition. Finally MidDilution improves nutritional parameters which leads to a better quality of life, as well as physical and mental status.

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LONGITUDINAL CHANGES IN PHASE ANGLE REFLECT CHANGES IN SERUM IL-6 LEVELS IN MAINTENANCE HEMODIALYSIS PATIENTS

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We hypothesized that longitudinal changes in phase angle (PA) may have independent associations with changes in inflammatory parameters over time and consequently with long-term survival in maintenance hemodialysis (MHD) patients.Dietary energy and protein intake, biochemical markers of nutrition, body composition (anthropometry and bioimpedance analysis) and IL-6 as inflammatory marker, were measured at